

4. SUMMARY OF SOUTH PACIFIC AND SOUTH INDIAN TROPICAL CYCLONES

4.1 GENERAL

On 1 October 1980, JTWC's area of responsibility (AOR) was expanded to include the Southern Hemisphere from 180° east longitude westward to the coast of Africa. Details on Southern Hemisphere tropical cyclones and JTWC warnings from July 1980 through June 1982 are contained in Diercks et al. (1982) and from July 1982 through June 1984, in Wirfel and Sandgathe (1986). Information on Southern Hemisphere tropical cyclones after June 1984 can be found in the applicable Annual Tropical Cyclone Report. The Naval Western Oceanography Center (NWOC) Pearl Harbor, HI issues warnings on tropical cyclones in the South Pacific east of 180° east longitude.

In accordance with CINCPACINST 3140.1V, Southern Hemisphere tropical cyclones are numbered sequentially from 1 July through 30 June. This convention is established to encompass the Southern Hemisphere tropical cyclone season, which primarily occurs from January through April. There are two ocean basins for warning purposes - the South Indian (west of 135° east longitude) and the South Pacific (east of 135° east longitude) - which are identified by appending the suffixes "S" and "P" respectively to the tropical cyclone number.

Intensity estimates for Southern Hemisphere tropical cyclones are derived from the interpretation of satellite imagery using the Dvorak technique (Dvorak, 1984) and in rare instances from surface observations. The Dvorak technique relates specific cloud signatures to maximum sustained one-minute average wind speeds. The conversion from maximum sustained winds to minimum sea-level pressure is obtained from the Atkinson and Holliday (1977) relationship (Table 4-1).

4.2 SOUTH PACIFIC AND SOUTH INDIAN OCEAN TROPICAL CYCLONES

Tropical cyclone activity in 1992 (Table 4-2) which includes the period of 1 July 1991 to 30 June 1992 was three above the climatological mean of 27 storms, and the third highest seasonal total since 1981 (Table 4-3). The above-average number of cyclones was a reflection of very high activity in the Southeast Pacific. A record thirteen cyclones developed east of 165° east longitude, 12 more than last year and 7

TABLE 4-1 MAXIMUM SUSTAINED SURFACE WINDS AND EQUIVALENT MINIMUM SEA-LEVEL PRESSURE (ATKINSON AND HOLLIDAY, 1977)

MAXIMUM SUSTAINED SURFACE WIND (KT)	MINIMUM SEA-LEVEL PRESSURE (MB)
30	1000
35	997
40	994
45	991
50	987
55	984
60	980
65	976
70	972
75	967
80	963
85	958
90	954
95	948
100	943
105	938
110	933
115	927
120	922
125	916
130	910
135	906
140	898
145	892
150	885
155	879
160	872
165	865
170	858
175	851
180	844

above the 1981-1992 average (Table 4-4). Tropical cyclones started in mid-September and ended in early May. An unusually active February resulted in a record 11 cyclones forming that month, with the JTWC warning on 5 cyclones for a 2-day period late in the month (Figure 4-1). Composites of the best tracks are provided in Figures 4-2 and 4-3.

The JTWC was in warning status a total of 98 days, which includes 25 days when the JTWC issued warnings on two or more Southern Hemisphere cyclones, 13 days with three or more, 6 days with four or more, and 2 days with five cyclones occurring simultaneously. For the record, if the number of Southeast Pacific warning days were added to those of the Southwest Pacific and South Indian Oceans, the total would increase from 98 to 120 days. All tropical cyclones warnings with the exception of those for Tropical Cyclone 18P were preceded by Tropical Cyclone Formation Alerts. Tropical cyclones 06P (Val), 21P (Esau), and 25P (Fran) all made it to super typhoon intensity in contrast to only one during the 1991 year.

TABLE 4-2 SOUTH PACIFIC AND SOUTH INDIAN OCEAN 1992 SIGNIFICANT TROPICAL CYCLONES
(1 July 1991 - 30 June 1992)

TROPICAL CYCLONE	PERIOD OF WARNING	NUMBER	MAXIMUM	ESTIMATED
		WARNINGS	SURFACE	
		ISSUED	WINDS-KT (M/SEC)	MSLP (MB)
01S ----	11 Sep - 13 Sep	5	40 (21)	994
02S ----	17 Oct - 21 Oct	8	35 (18)	997
03P Tia	15 Nov - 21 Nov	17	95 (49)	949
04S ----	22 Nov - 26 Nov	10	45 (23)	991
05S Graham	02 Dec - 10 Dec	19	120 (62)	922
06P Val	05 Dec - 13 Dec	17	140 (72)	898
07P Wasa	05 Dec - 13 Dec	16	105 (54)	938
08P Arthur	15 Dec - 17 Dec	4	45 (23)	991
09S Alexandra	20 Dec - 25 Dec	12	105 (54)	938
10S Bryna	30 Dec - 02 Jan	7	45 (23)	991
11P Betsy	06 Jan - 15 Jan	19	95 (49)	949
12P Mark	08 Jan - 10 Jan	6	55 (28)	984
13P ----	17 Jan - 18 Jan	4	35 (18)	997
14P Cliff	06 Feb - 09 Feb	7	60 (31)	980
15S Celesta	11 Feb - 13 Feb	5	45 (23)	991
16S ----	12 Feb - 14 Feb	4	25 (13)	1003
17P Daman	14 Feb - 19 Feb	11	85 (44)	958
18P ----	19 Feb - 20 Feb	4	35 (18)	997
19S Davilia	23 Feb - 24 Feb	3	35 (18)	997
20S Harriet	26 Feb - 08 Mar	23	120 (62)	922
21P Esau	26 Feb - 06 Mar	20	130 (67)	910
22S Farida	26 Feb - 03 Mar	15	120 (62)	922
23S Ian	26 Feb - 03 Mar	13	115 (60)	927
24S Gerda	27 Feb - 28 Feb	3	35 (18)	997
25P Fran*	06 Mar - 17 Mar	23	140 (72)	898
26P Gene	15 Mar - 19 Mar	9	65 (33)	976
27P Hettie	25 Mar - 29 Mar	9	50 (26)	987
28S Neville	06 Apr - 14 Apr	18	120 (62)	922
29S Jane/Irna	08 Apr - 18 Apr	23	120 (62)	922
30P Innis	28 Apr - 02 May	8	65 (33)	976
Total:		340		

* First 2 Warnings Issued by NWOC

NOTE: Names of Southern Hemisphere Tropical Cyclones are given by the Regional Warning Centers (Nadi, Brisbane, Darwin, Perth, Reunion and Mauritius) and are appended to JTWC Warnings, when available.

TABLE 4-3

MONTHLY DISTRIBUTION OF SOUTH PACIFIC AND
SOUTH INDIAN OCEAN TROPICAL CYCLONES

YEAR (1959-1978)	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
AVERAGE*	-	-	-	0.4	1.5	3.6	6.1	5.8	4.7	2.1	0.5	-	24.7
1981	0	0	0	1	3	2	6	5	3	3	1	0	24
1982	1	0	0	1	1	3	9	4	2	3	1	0	25
1983	1	0	0	1	1	3	5	6	3	5	0	0	25
1984	1	0	0	1	2	5	5	10	4	2	0	0	30
1985	0	0	0	0	1	7	9	9	6	3	0	0	35
1986	0	0	1	0	1	1	9	9	6	4	2	0	33
1987	0	1	0	0	1	3	6	8	3	4	1	1	28
1988	0	0	0	0	2	3	5	5	3	1	2	0	21
1989	0	0	0	0	2	1	5	8	6	4	2	0	28
1990	2	0	1	1	2	2	4	4	10	2	1	0	29
1991	0	0	1	1	1	3	2	5	5	2	1	1	22
1992	0	0	1	1	2	5	4	11	3	2	1	0	30
TOTAL:	5	1	4	7	19	38	69	84	54	35	12	2	330
(1981-1992)													
AVERAGE:	0.4	0.1	0.3	0.6	1.6	3.2	5.8	7.0	4.5	2.9	1.0	0.2	27.5

* (Gray, 1979)

TABLE 4-4

ANNUAL VARIATION OF SOUTHERN HEMISPHERE
TROPICAL CYCLONES BY OCEAN BASIN

YEAR (1959-1978)	SOUTH INDIAN (WEST OF 105°E)	AUSTRALIAN (105°E - 165°E)	SOUTH PACIFIC (EAST OF 165°E)	TOTAL
AVERAGE*	8.4	10.3	5.9	24.7
1981	13	8	3	24
1982	12	11	2	25
1983	7	6	12	25
1984	14	14	2	30
1985	14	15	6	35
1986	14	16	3	33
1987	9	8	11	28
1988	14	2	5	21
1989	12	9	7	28
1990	18	8	3	29
1991	11	10	1	22
1992	11	6	13	30
TOTAL:	149	113	68	330
(1981-1992)				
AVERAGE:	12.4	9.4	5.7	27.5

* (Gray, 1979)

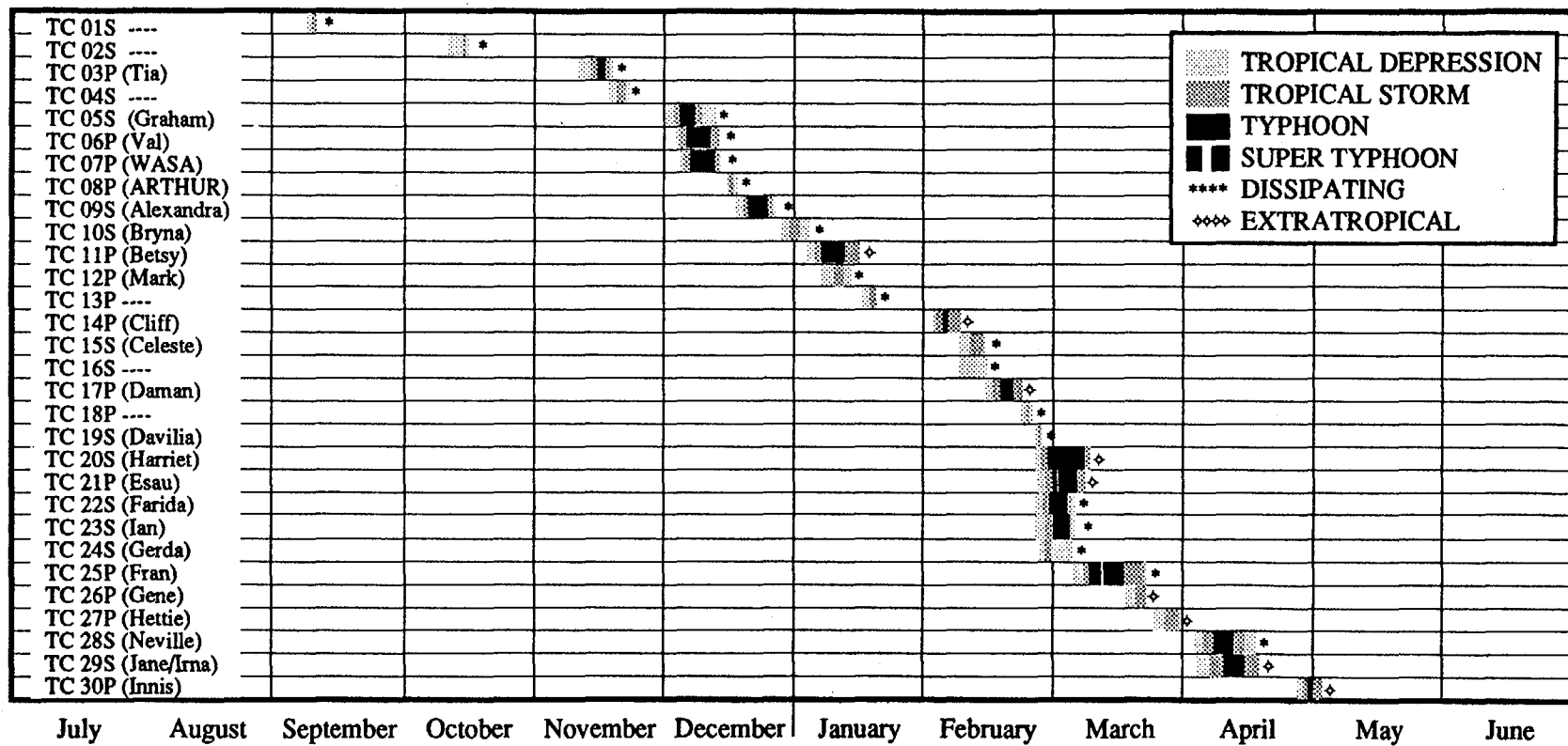


Figure 4-1. Chronology of South Pacific and South Indian Ocean tropical cyclones for 1992.

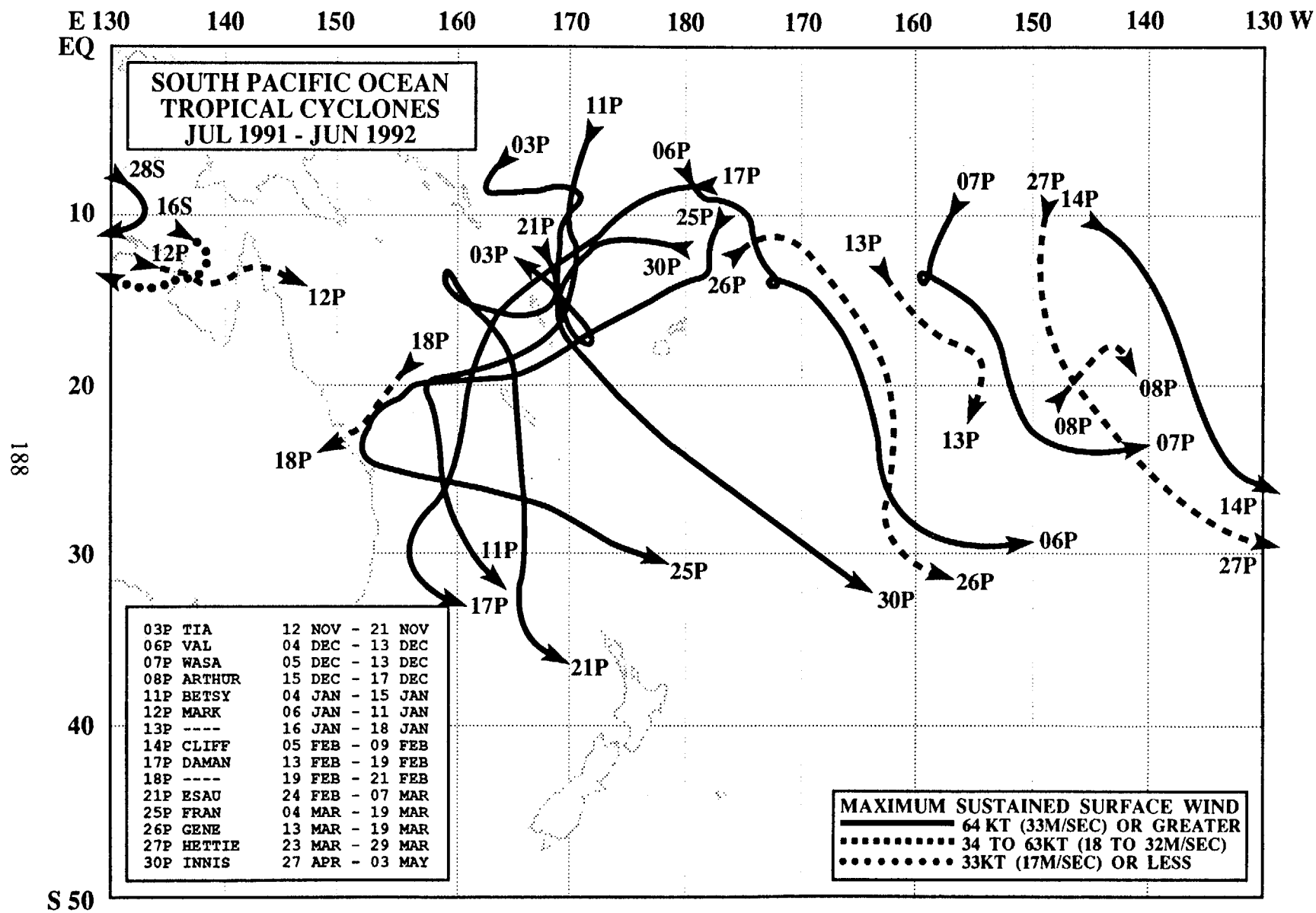


Figure 4-2. Tropical cyclone best tracks east of 130° east longitude.

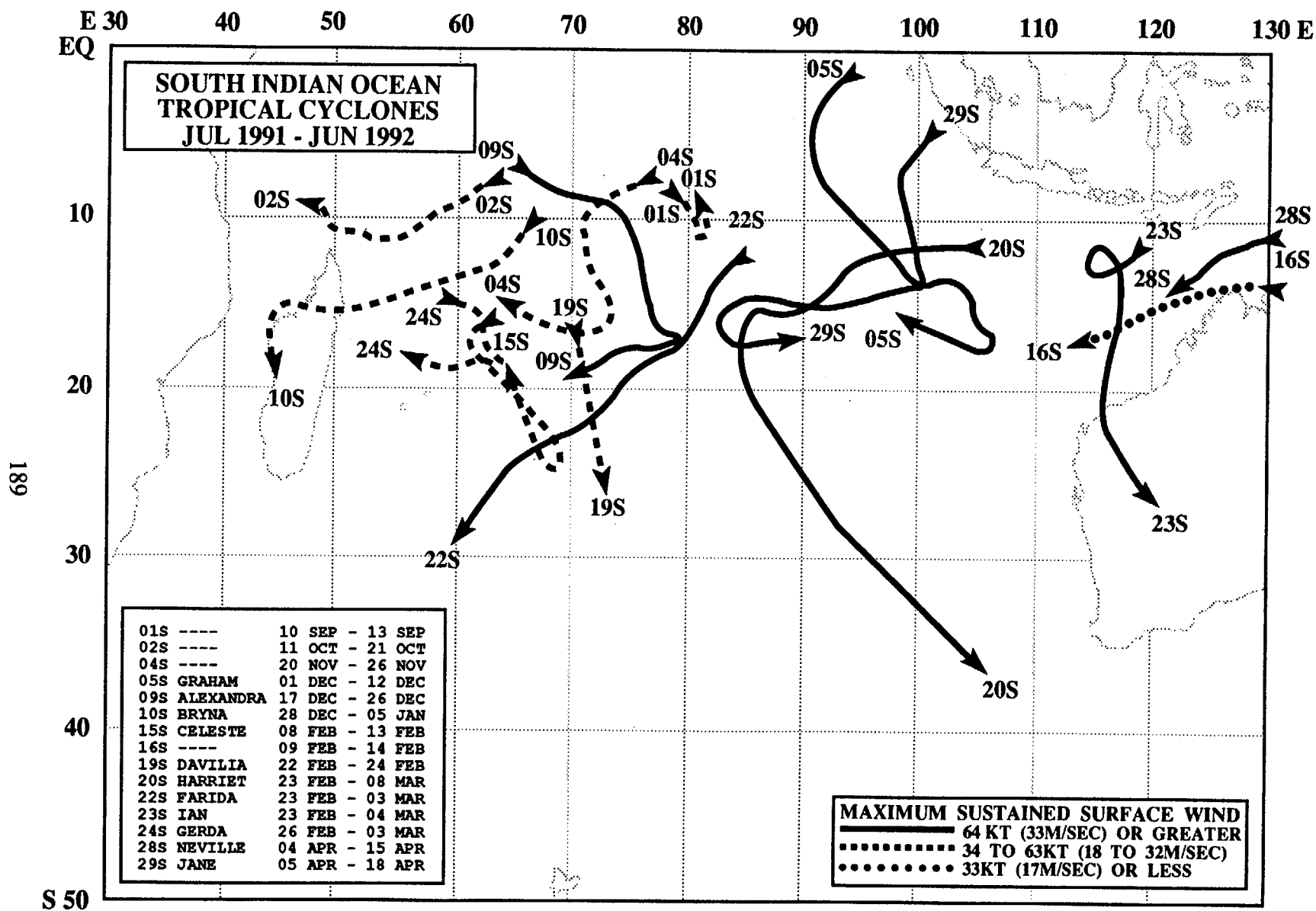


Figure 4-3. Tropical cyclone best tracks west of 130° east longitude.

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